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SPECIFICATION FOR JOTTER BALL POINT PENS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR JOTTER BALL POINT PENS

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SPECIFICATION FOR JOTTER BALL POINT PENS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 28 April 1983, after the draft finalized by the Pens Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

0.2 This standard covers the requirements of essential materials, dimensions necessary for interchangeability and functional tests to ensure good writing quality and reasonable life.

0.3 IS : 10560-1983* is a necessary adjunct to this standard.

0.4 This standard contains clauses which call for agreement between the purchaser and the supplier and which permit the purchaser to use his option for selection to suit his requirement. The relevant clauses are **5.1** and **7.1**.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for single refill jotter ball point pens.

2. MATERIAL

2.1 The materials used in the manufacture of jotter ball point pens shall be either metal with suitable corrosion resistant finish or plastics or both. The plastics used shall be either cellulose acetate-butyrate or hard grade polypropylene or acrylic nitrile butadiene styrene or Type 3 polystyrene conforming to IS : 2267-1972‡. It shall satisfy the flammability test specified in **4.6** and the accelerated ageing test specified in **4.5**.

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*Specification for jotter ball pen refills.

†Rules for rounding off numerical values (*revised*).

‡Specification for polystyrene moulding materials (*first revision*).

2.1.1 Metal parts shall pass the corrosion test specified in **4.7**.

2.1.2 The spring used shall be made of spring steel or phosphor bronze wire and shall pass the test specified in **4.8**.

3. REQUIREMENTS

3.1 The length of the body (barrel) of the jotter ball point pen shall suit the length of the refill as well as the actuating mechanism so that the writing tip of the refill, when lowered, shall project not less than 2·5 mm and not more than 3·5 mm. The barrel shall preferably be of round shape, uniformly tapered and smoothly finished, so as to provide a comfortable finger grip while writing. Diameter of the barrel shall be such that there is sufficient space for movement of the refill.

3.2 The threads used in various mating parts shall be well formed and shall screw well. The threaded portion of barrel and cap shall be minimum 1 cm. The mated parts shall not have any shake or play. The threads shall be interchangeable with parts of the same make and all parts of the pen of same type and make shall be interchangeable.

3.3 The barrel, the cap, the actuating mechanism and the orifice for the writing tip shall all be concentric and well aligned.

3.4 When the refill is to be replaced, no part of the actuating mechanism shall become disassembled and fall from the barrel or the cap.

3.5 The actuating mechanism shall be such that there shall be no failure in either clicking, refilling or retracting it. It shall pass the functional test specified in **4.9**.

3.6 A pocket clip shall be suitably affixed with the cap of the pen. The tip of the clip shall be rounded smooth so that it does not tear the cloth when clipped in and out and shall have a reasonably tight grip. The clip shall neither rotate on its axis nor shall it be loose when mounted. It shall pass the functional test specified in **4.3**.

3.7 The refill used shall conform to IS : 10560-1983*. The jotter ball point pen fully assembled (including the refill) shall be sound in every respect and shall pass the impact test specified in **4.10** and the load test specified in **4.11**.

3.8 The finish of external and internal surface shall be smooth, free from defects and shall not have scratches, blisters, pits, sharp edges. The clip shall be finished smooth and shall be free from all defects. The metallic clip shall be plated suitably.

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*Specification for jotter ball pen refills.

4. TESTS

4.1 Starting Test — An unused pen shall be kept in the vertical position with the refill propelled and the writing tip up for 30 minutes. The pen shall now be tested by drawing it 200 mm across a sheet of white super calendered printing paper or cream laid or cream wove paper conforming to IS : 1848-1971* at a rate of approximately 100 mm/second with normal writing pressure. The pen shall start drawing the continuous line within a distance of 15 mm from the starting point.

4.2 Freedom from Clogging — The pen is kept in the vertical position with the refill propelled and the writing tip up for 4 hours. When the refill of the pen is retracted and the pen is kept in the horizontal position for 4 hours, the pen shall again satisfy the requirements of starting test.

4.3 Clip Action — The clip shall be lifted 4 mm from the surface of the cap and then released. The clip shall return to the original position touching the surface of the cap. After this test is repeated 100 times, the clip shall hold a sheet of paper without scratching it.

4.4 Body and Cap Tightness — The pen shall be uncapped and capped to normal tightness 50 times. After this test, the mated parts shall not shake or play and the pen shall write normally and its actuating mechanism shall function properly.

4.5 Accelerated Ageing Test — Different parts of the pen made of plastics material shall pass the accelerated ageing test when subjected to the temperature cycle as specified below:

Time	*Temperature*
2 h	—10 ± 1°C
4 h	0 ± 1°C
4 h	50 ± 1°C
4 h	0 ± 1°C
4 h	50 ± 1°C
7 days	27 ± 1°C

The material shall not warp, crack, discolour or get deformed after the test.

4.6 Flammability Test — The specimens of the plastics of the jotter pens shall be prepared and tested in accordance with the method given in Appendix A. They shall be deemed to have passed the test if they are flame-resistant, self-extinguishing or slow burning.

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*Specification for writing and printing papers (*first revision*).

4.7 Corrosion Resistance Test — The metallic parts shall be subjected to a corrosion resistance test as follows:

> The metal parts shall be dipped in a boiling 10 percent (w/w) aqueous solution of sodium chloride for a period of 15 minutes. After removal from this solution, they shall be immersed in a 10 percent aqueous solution of sodium chloride at room temperature, for one hour. They shall then be removed, wiped with a soft cloth and allowed to dry for 24 hours at room temperature. The metal parts shall not show any visible signs of corrosion.

4.8 Compression Test on Spring — Compress the spring fully and release it for 25 times. The spring shall show neither any permanent set nor lose its action.

4.9 Functional Test — The refill in the pen shall be propelled and retracted successively and quickly 50 times by operating the actuating mechanism. The pen shall function normally after the test and the actuating mechanism shall not be damaged.

4.10 Hardness Test — A sheet of paper shall be placed on a platform scale. The sample pen, with the refill propelled shall be held between 3·2 mm and 3·8 mm from the writing end at an angle of 50° from the horizontal without hand touching the paper. The force of 9 kg shall be applied gradually and uniformly within a period of approximately 5 seconds and immediately released. The tip shall then be examined under microscope and there shall not be any major deformation on the tip.

4.11 Load Test — When the pen, with the refill propelled, is pressed for five minutes against a hard surface, such as a glass sheet placed horizontally with a force not less than 2 kgf (20 N approx) applied gradually at right angles to the horizontal hard surface while holding the pen between 30 to 40 mm from the ball end and keeping it at an angle of 50° from the horizontal, the pen shall neither break nor its parts get disassembled.

5. SAMPLING

5.1 Sampling procedure and acceptance criteria for jotter ball point pens shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Appendix B.

6. MARKING

6.1 Each pen shall be marked with the manufacturer's name or initials or registered trade-mark on its barrel and cap.

6.1.1 The pens may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

7. PACKING

7.1 Ball point pens shall be suitably packed in cartons or as agreed to between the purchaser and the supplier.

APPENDIX A

(*Clause* 4.6)

TEST FOR FLAMMABILITY

A-0. GENERAL

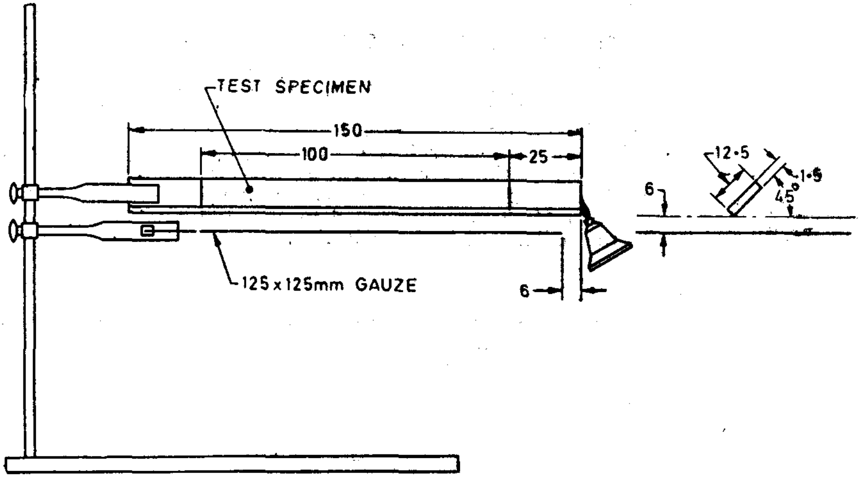
A-0.1 Outline of the Method — The specimen is clamped in horizontal position. A flame is applied for 10 seconds and the specimen allowed to burn; the time taken for the edge of the flame to travel 100 mm is measured.

A-1. TEST SPECIMEN

A-1.1 The specimen shall be 150 × 12·5 × 1·5 mm. Two lines shall be drawn across the specimen one at 25 mm and the other at 125 mm from one end. At least three specimens shall be used.

A-2. PROCEDURE

A-2.1 The test is carried out in a draught-free atmosphere. It shall be clamped in a rigid support at one end so that its longitudinal axis is horizontal and its transverse axis is at 45° to the horizontal and the two lines are clearly visible. A piece of 125 mm square clean wire gauze is clamped in horizontal position 6 mm below the specimen with 6 mm of the unsupported end of the specimen projecting beyond the edge of the gauze as shown in Fig. 1.



All dimensions in millimetres.

Fig. 1 Specimen Under Test for Rate of Burning

A-2.2 An alcohol lamp (spirit lamp) with a non-luminous flame 12 to 20 mm in height shall be placed under the free end of the specimen so that the top of the flame just touches it. The flame shall be removed after 10 seconds and specimen allowed to burn. The time taken for the edge of the flame to travel the distance of 100 mm between the two lines shall be measured with a stop-watch and the rate of burning of the specimen in millimetres per minute calculated therefrom. The rate of burning of the material shall be the arithmetic mean of the results obtained on three specimens. Any specimen which does not burn to the second mark shall be discarded and replaced. If three consecutive specimens do not burn to the second mark, the material shall be reported as resistant to flame propagation. If three specimens do not burn to the second mark and show no flame or after-glow 5 seconds after the burner has been removed, the material is deemed to be self-extinguishing. If the specimens continue to burn at a rate of less than 65 mm per minute, the material is slow burning.

APPENDIX B

(*Clause* 5.1)

SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR JOTTER BALL POINT PENS

B-1. LOT

B-1.1 In any consignment, all the jotter ball point pens of the same type and manufactured under similar conditions from the same raw material shall be grouped together to constitute a lot.

B-1.2 For ascertaining the conformity to the requirement of the standard, samples of pen shall be selected and tested separately from each lot.

B-2. SAMPLING

B-2.1 The number of pens to be selected at random from the lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

Lot Size	For Requirements in **3.1** to **3.2**		For Tests in **4.1, 4.2, 4.3, 4.4, 4.8, 4.9, 4.10, 4.11**	
	Sample Size	Acceptance Number	Sub-sample Size	Acceptance Number
(1)	(2)	(3)	(4)	(5)
Up to 150	32	2	5	0
151 to 300	50	3	8	0
301 to 500	80	5	10	0
501 to 1 000	125	7	13	0
1 001 to 3 000	200	10	15	1
3 001 and above	315	14	20	1

B-2.2 The pens in the sample shall be selected at random from the lot and in order to ensure the randomness of selection, IS : 4905-1968* may be used.

B-3. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

B-3.1 The pens selected according to **B-2.1** and **B-2.2** shall be inspected for requirements (**3.1** to **3.8**). A pen failing in any one or more of the requirements shall be considered as defective. The lot shall be considered as conforming to the requirements of the characteristics mentioned above, if the number of defective pens in the sample does not exceed the number given in col 3 of Table 1.

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*Methods for random sampling.

B-3.2 The lot having been found conforming to **B-3.1**, shall be tested for Starting Test (**4.1**), Freedom from Clogging (**4.2**), Clip Action (**4.3**), Body and Cap Tightness (**4.4**), Compression Test on Spring (**4.8**), Functional Test (**4.9**), Hardness Test (**4.10**), and Load Test (**4.11**). For this purpose, a sub-sample of the size given in col 4 of Table 1 shall be taken from pens selected as for **B-2.1** and **B-2.2**. Each of the pens in the sub-sample shall be subjected to the tests mentioned above. A pen failing in any one or more of the tests shall be considered as defective. The lot shall be considered as conforming to the requirements of the tests if the number of defectives in a sub-sample does not exceed the number given in col 5 of Table 1.

B-3.3 The lot having been found conforming to **B-3.2**, a sample of jotter pen shall be tested for Accelerated Ageing Test (**4.5**), and Corrosion Resistance Test (**4.6**). If it passes both the tests, the lot shall be considered as conforming to these requirements.

B-3.4 If the lot is conforming to the requirement as mentioned in **B-3.3**, the flammability test (*see* **4.6**) shall be carried out as given in Appendix A.

B-3.5 The lot shall be accepted if **B-3.1**, **B-3.2**, **B-3.3** and **B-3.4** are satisfied, otherwise rejected.